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ABSTRACT

This paper on multimedia in German libraries begins with an introduction to multimedia. Initiatives of the federal government and in the Laender (federal states) are then described, including: a 1997 symposium organized by the university library of Goettingen that presented several multimedia models developed in universities; the multimedia program of the Federal Ministry of Economics; Federal Ministry of Education and Research promotion of projects for the development of multimedia education tools for both schools and universities; the German Research Foundation strategic research initiative; the "Future for the Young Generation" project in Baden-Wurttemberg; the Digital Video Archive at the University of Karlsruhe; and the multimedia teaching and learning server at the University Library of Essen. Future developments are also addressed. (MES)

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Multimedia in German libraries - aspects of cooperation and integration [1]

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Paper

Overview:

1. Introduction to multimedia
2. Initiatives of the Federal Government
3. Initiatives in the "Laender" (federal states)
4. Examples

Introduction

"Multimedia" is perhaps today's "coolest" media. You can find it nearly everywhere! We are in the multimedia age, we use multimedia-PCs, we know multimedia stars and experts, multimedia screen designers are needed by multimedia producers, multimedia talents are sought and multimedia research scholars - and librarians! - are needed . Books with the term "multimedia" in their title seem to sell well. In our library network I found more than 4000 items with this term.

But what do we understand by the term "multimedia"? In general, it means a combination of text, sound, and images, including moving images, video sequences, for instance, or computer simulations.

Here are some definitions of the term I have found:

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The "Free On-line Dictionary of Computing"[2] gives the following definition:

[1] Contribution for the Workshop on "Cooperation between Institutions concerning access to audiovisual and multimedia material" of the IFLA Section on Audiovisual and Multimedia, 17-08-2000, Jerusalem
[2] http://www.de.easynet.net/resources/foldoc/index.html

"Human-computer interaction involving text, graphics, voice and video. Often also includes concepts from {hypertext}.

This term has come to be almost synonymous with {CD-ROM} in the {personal computer} world because the large amounts of data involved are currently best supplied on CD-ROM." This was a statement dating from 02 December 1994.

Today, the Internet seems to take over the place of CD-ROMs Mary A. Burke[3] (in her book "Organization of Multimedia Resources, 1999) gives the following definition: "the integrated storage, retrieval and display of words, numbers, images and sounds by a computer system".

Beside this form of multimedia, which one uses generally in a one way communication, we also know interactive multimedia.

The Encyclopedia Britannica[4] gives the following definition: "Interactive multimedia: any computer-delivered electronic system that allows the user to control, combine, and manipulate different types of media, such as text, sound, video, computer graphics, and animation." This is of course a more sophisticated form of multimedia and will certainly be very successful in the future, as disk space and computer technology get cheaper and cheaper....

Present Situation in the Federal Republic of Germany

In Germany, there are many universities and learning institutions that develop learning and teaching software for application in research and education with a high personal and financial effort. Yet, most of these tools are used only by their creators and colleagues in the same university department, even if usage is free of charge. As there is no systematic information service for these products, they reach only a small community.

Already in 1997, the university library of Goettingen organized a symposium about "Changes in information infrastructure" [5] that presented several multimedia models developed in universities, for instance :

"Der Aufbau von lernförderlichen Infrastrukturen" (Establishing infrastructures for better learning), Music lectures via Internet, or Model building and simulation - multimedia-toolboxes in physics teaching. All of these projects developed continually over the last years.

The German Science Council ("Deutscher Wissenschaftsrat") published its recommendations[6] for multimedia use in May 1998, emphazising that multimedia is a part of the modern university structure that can no longer be neglected. Its quick introduction is indispensable, and new strategies for the necessary competencies and equipment are needed.

The Council stated as well that there is a lack in regard to common usage in the possible areas of application, giving only few stimuli. In the universities multimedia is not yet used in an "every-day" manner . In many places there are no

institutional routines to promote the usage of multimedia in education.

[3] Burke, Mary A.: Organization of Multimedia Resources, 1999
[4] URL: http://www.britannica.com/
[5] Most of the contributions can be found in "Bibliothek Forschung und Praxis 22(1998) p. 13-96, also available online:
http://webdoc.sub.gwdg.de/edoc/aw/bfp/t8022001.htm
[6] http://www.wrat.de/drucksachen/drs3536-98/drs3536-98.htm

The German Government, however, is aware of the new opportunities multimedia applications offer and promotes multimedia projects.

There are several ministries promoting multimedia projects. The multimedia program of the Federal Ministry of Economics (Bundesministerium für Wirtschaft) aims to develop modern information and communication services using multimedia. Projects supported include those by companies, universities and research institutions.

The Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung) is promoting projects for the development of multimedia education tools for both schools and universities. It also promotes projects which make knowledge accessible in digital form, for example digital libraries that enhance quick and comprehensive access to scholarly information. This programme also includes provisions for electronic and multimedial publishing. One of the projects is the "Image Library of Biological Macromolecules" at the University of Jena[7] . The IMB Jena Image Library of Biological Macromolecules aims at a better dissemination of information on three-dimensional biopolymer structures with an emphasis on visualization and analysis. It provides access to all structure entries deposited at the Protein Data Bank (PDB) or at the Nucleic Acid Database (NDB). In addition, basic information on the architecture of biopolymer structures is available. The IMB Jena Image Library intends to fulfill both scientific and educational needs.

The German Research Foundation (Deutsche Forschungsgemeinschaft DFG) started its strategic research initiative "V3D2" ("Distributed Processing and Delivery of Digital Documents") at the end of 1997.

About 23 research projects are currently funded in the following central areas :

Management and exchange of digital documents
Creation, compression and data transmission
Multimedial teaching and learning systems
Joint research with libraries
New applications and new aspects of use

The DFG has just launched another initiative for the enhancement of "Information infrastructures for network-based research cooperation and digital publications" [8] .

Explicitly mentioned in this initiative are: Further development of user-friendly access and research methods for multimedial publications, using international standards, and the establishment of competencies in advising on electronic and multimedial publications.

There is a lot of promotion, but what do we find realized already? A general summary is not feasible in the time granted for this presentation, so let us look at some of the results.

As Germany is a federal republic, the "Länder" (federal states) often have their own projects promoting multimedia, and in fact, some of them have started their own initiatives.

[7] http://www.imb-jena.de/
[8] http://www.dfg.de/foerder/formulare/1_53.htm

Let me start with Baden-Württemberg in southern Germany, with a well developed industry (Daimler-Chrysler is there).

The government of Baden-Württemberg started the initiative "A future for the young generation" :"Zukunftsoffensive Junge Generation"[9] to promote new technologies: One part of this initiative is the "Multimedia Project" [10] . Its intention is the provision of multimedia objects of all kinds as an "every-day" service offered in libraries. The library network of Baden-Würtemberg, the BSZ (library service center) participates with a partial project.

Their task is the development of an independent server for digital objects for audio documents of contemporary history . These audio documents come from the Deutsches Rundfunkarchiv (German Broadcasting Archive) which has stored the documents in digital form.

The documents stored in the archive comprise an extensive collection of sound and film documents produced by the federal broadcasting stations (nearly every state has its own broadcasting station). The task of the Library network is to make relevant contemporary sound documents accessible on suitable digital mass storage media.

The virtual media server allows the creation of a deep subject indexing, as abstracts are already included for each document.

The audio format for the presentation on the Internet is "Real Audio", as this avoids copyright infringement. The safety of the archived objects is not touched, since the objects made available are stored on a special server.

The task of the project, which is to make these objects accessible for the learning institutions of the Land Baden-Württemberg without any cost, has been fulfilled. They can be used from the work places, from the reading rooms and from departments in the universities. Currently, 25 simultaneous accesses are possible.

In February of this year the archive[11] contained 181 "RealAudio"-files which can be used with the RealPlayer 7 application, which is available in a basic version free of charge.

Here follow some technical aspects:

Hardware: Sun E450 (with Solaris 2.6 as operating system)
Software: Streaming-software from Real Networks:
Realserver (version for Solaris2.6)
Realproducer (Windows-based version) to produce audio files for the Realserver
Realplayer G2 as the reproduction medium (only for Windows)
Webserver: Apache version 1.3.4 of Apache Software Foundation.

Another project in Baden-Württemberg, at the University of Karlsruhe, is "DIVA",

the Digital Video Archive[12] of the University. Its aim is the enhancement of usability of audiovisual resources through digitization.

[9] http://www.baden-wuerttemberg.de/zukunftsoffensive/
[10] http://www.bsz-bw.de/diglib/agmm/mmprojbesch.html
[11] Direct access via: http://www.bsz-bw.de/multimedia/mmarchiv/ An example from the voices of the 20th century:
http://www.bsz-bw.de/multimedia/mmarchiv/dra_cd_2_1997.html
[12] http://www.ubka.uni-karlsruhe.de/allg/projekte/multimedia/projektantrag.html

By digitizing videos it is possible to make these materials accessible at the work places of researchers and students, at any time and without the need of support by library staff.

As videos are not archival material and suffer both from usage and from non-usage, storage in digitzed formats seems a way to resolve some of the problems. In digitzed form availability will increase considerable, the master does not suffer from copies taken, frequent usage does not harm the media and is even possible by serveral users at the same time. The project wants to resolve the problem of how to handle the digitization of huge amounts of data and to find transferable solutions. As the copyright question is a severe one in this field, the archive actually offers only self-produced materials and some recordings from television produced for special institutes or departments of the university for teaching purposes.

All videos digitized exist in analog form as VHS-tapes. The University library uses a digitization facility based on Apple Macintosh computers. The videos are digitized as MPEG1 files, which is still a global standard (with encoder card "mediapress" by "Wired"). Both of the internet formats Quicktime and RealG2 are produced with the encoder card "Media 100" by Terran. The archival format finally is MPEG2.

The metadata produced for the digitized videos are recorded in the Library Network of Baden-Württemberg and are of course available via the local opac, but also via the homepage of the University Library.

These are, one could say, classical digitization projects. They convert resources to a new format which enhances access and usability. This is certainly necessary, but this is not yet the whole impact of the possibilities multimedia offers.

From the southwest let us got to the northwest of Germany, to Northrhine Westphalia. This state has for a long time been famous for its heavy industry and coal mining, and also for its chemical industry (Bayer). It is one of the Länder with an important number of universities and polytechnic universities.

In 1997 the state universities founded the Competencies Network MultiMedia[13] . Its aim is to develop and exchange multimedia teaching modules in order to improve the quality of both teaching and learning in the universities.

The core of this network is a working group consisting of 15 lecturers from the universities and representatives from the Ministry of Education and Continuing Education, Science and Research of Northrhine-Westphalia. This group selects the projects for promotion.

The current projects comprise the fields of the humanities, engineering, mathematics and sciences, sports, economics, and law.

The promotion program is running for the fourth time. For the years 2000 to 2001 about 2 Million Deutschmark are available for 8 - 10 projects. Most of the projects are under way.

A long distance goal is to include the results in the "Digital Library" of Northrhine-Westphalia, but as you know, copyright questions are not easy to resolve. For the moment the cooperation with the libraries is not yet everywhere clearly defined.

This Digital Library of Northrhine-Westphalia is the portal for electronic resources in this state. It gives access to many German and international library catalogs or library networks as well as to

[13] http://www.uvm-nw.de

electronic resources for universities which have obtained the required licences, for instance for subject databases or electronic journals from publishers (as Elsevier), granting access to the full texts. Online ordering of journal articles is also part of this portal.

Unaffiliated users may use free electronic resources, while the rest is accessible only for registered users of universities.

Within this Digital Library multimedia resources will find their place.

Projects in Universities

One of the best-known multimedia projects in this state is MILESS- the multimedia teaching and learning server in Essen ("Multimedialer Lehr- und Lernserver Essen").

The aim of MILESS[14] is to promote the wide usage of multimedia technologies as auxiliary tools for study and teaching, by providing an infrastructure for all interested people (teachers and students), while relieving the burden of technical problems (storage, access).

The University Library of Essen undertakes the task to find out all the relevant electronic and multimedia publications and products in cooperation with the university departments and to provide cataloging, the access and also the archival function. All services in MILESS are also accessible via the general digital services of the library, such as the OPAC or database searches and so on.

MILESS functions as an archive for images, sounds and videos, but also offers software tools for courses, such as simulation programmes or dictionaries. It also provides course materials for seminars, primary and secondary bibliographies and so on. Within the concept of MILESS it is also possible to administer individual access rights (wiriting or reading acces only), events, or making the resources accessible only for a clearly defined community.

For the use of MILESS the university library has installed 55 multimedia PCs, but of course the system is accessible from any computer that has access to the university network. Here are some details about the hard- and software MILESS Hardware details 2 servers integrated as 2 nodes within an IBM RS/6000 SP with 2 times 256 MB main storage (UNIX system AIX 4.3) and an IBM 3494 Tape Library as automatic tape archive with 8 terabyte storage capacity.

Software: IBM DB2 Digital Library V2.4 And IVM ADSTAR Distributed Storage Manager (ADSM) as backup and archiving system. Besides this a special MILESS software has been developed using JAVA and XML (for the Dublin Core Metadata Element Set).

In order to ensure the success of the MILESS project, it is necessary to make it well-known within the university. This is not as easy a task as it looks like. The potential users of MILESS are a hetereogeneous group of people, which is not generally enthusiastic about multimedia projects, mostly because of an incertainty in regard to Internet and multimedia applications. Beside the technical and service infrastructure, development of multimedia skills for the usage therefore are imperative.

MILESS has developed a graphical interface to make it easier for authors to contribute their work to MILESS. This works almost without any instructions on the use of the system. Contributors can use a

[14] http://miless.uni-essen.de

template for the metadata (Dublin Core) and can also define the access rights, that is whether the work is free for everyone on the Internet, or accessible only for the campus or an even smaller user group. They can also define the period of time for which their publication shall be available.

This information is used by the library to ensure or restrict the distribution and archiving of the resources. The library also helps defining the subject classification for the works. For the subject of physics it is possible to browse or search the PACS classification (Physics and Astronomy Classification Scheme) in MILESS.

MILESS is also the first step towards a - not only digital -university press for the University of Essen. MILESS is not yet integrated in the Digital Library of NRW, but its integration seems to come soon.

There are a lot of other projects under way, and I cannot mention them all.

Yet, not only big universities such as the University of Bielefeld have begun publishing "Digitale Semesterapparate" (digital readers for students, including lectures and hand-outs) on the Internet, which are also accessible via the homepage of the university library.

The libraries also offers multimedia rooms for using these resources. The use of these multimedia PCs is normally reserved for registered students/users only.

At the University of Goettingen we have just started a project to construct a cooperative local and supralocal competencies center for the development of multimedia resources and their access.

The "GWDG - Gesellschaft für wissenschaftliche Datenverarbeitung Göttingen" [15] , the computer center of the university, the Institute for Scientific Film ("IWF - Institut für den wissenschaftlichen Film" [16]) and the University Library of Goettingen[17] aim to create a common service for multimedia resources.

In a first step, a standard working place for multimedia is established and a prototype installed in the media room of the university library (in this room you also find work stations for internet usage and for CD-ROMs, video stations and a

working place for visually impaired people).

In an initial phase two CD-ROM publications of the Institute for Scientific Film are acessible on this multimedia work place:

WALD interaktiv - Ökosystemforschung Wald ("Forest interactive - research of the ecosystem forest"), which is an Expo 2000 project and The cell (a project promoted by the Ministry of Education and Research). Both publications use the multimedia approach to open new ways for understanding sophisticated processes. Numerous films, 3D models, computer animations as well as interactive experiments carried out in virtual laboratories enable the student to comprehend the processes better. Beside the CD-ROM, there exists also an Internet version of the "Cell": http://www.cells.de/cellseng/medienarchiv/index_medien.htm Since the combination of animation and sound is not of the same high quality as on the CD-ROM, we will offer an intranet version of this resource which has the same quality as the CD-ROM on the campus.

If this Intranet installation turns out to work well, other resources will be offered in a similar way.

[15] http://www.gwdg.de
[16] http://www.iwf.de
[17] http://www.sub.uni-goettingen.de/nojava_home.htm

For a later period, an interactive multimedia learning center within the library is planned for both university lectures and private study.

Future developments

All people involved in implementing multimedia resources within the universities and their libraries emphasize the necessity of cooperation to overcome the technical, juridical and organizationial impediments involved. Generally speaking, easy access is the first necessity, including easy handling of the systems for the creators of resources. Wide acceptance within the learning community will evolve as a result of that principle.

Let me just briefly mention at the end a new project which is under consideration for a grant at the Federal Ministry of Ecudation and Research: "Physics multimedial: teaching and learning modules for the study of physics as a subsidiary subject." This project is a joint effort of a confederation of universities in north Germany, e.g. Bremen, Greifswald, Hamburg, Oldenburg and Rostock in cooperation with the San Diego State University, the Universities of Potsdam (near Berlin), Düsseldorf, the Technical University of Berlin and the polytechnic university of Gelsenkirchen..

The aim of the project is to establish well-structured resources of multimedia modules which are coordinated in regard to didactics and methods for the research, teaching and study of physics as a subsidiary subject (physics for chemists, medical students, students of electrical engineering etc.). The modules are multimedial script components, visualisations, tutorial units for self study, virtual laboratories and can be used by the teachers in a very flexible manner for various lecture and teaching concepts. They are available at the same time for the self study of students.

Every module will have a didactic-methodical description for usage within a teaching-learning situation, including concrete proposals for homework and

classwork with the students. Access will be granted via a central Internet portal based on local networks of their university and state servers. Workshops will accompany the whole project phase, where students and teachers can discuss the modules and their effectiveness. The project's running time is 3 years.

I hope very much that this project may be realized and may give the opportunity to diminish the still existing hesitations to use multimedia tools.

The libraries will support these efforts as much as possible, but is is still a long way until multimedia resources will be widely used everywhere within the scholarly world.

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